ABSTRACT OF THE DISCLOSURE

A regenerative or toric pump adds energy to a fluid using an impeller having an axis of rotation and axially spaced, radially extending first and second surfaces. A casing encloses the impeller and has a fluid inlet and a fluid outlet separated by a stripper. The casing has axially spaced, radially extending first and second sidewalls facing the first and second surfaces of the impeller respectively. Axially and radially extending blades or vanes are formed on an outer radial periphery of the impeller for driving fluid from the inlet toward the outlet as the impeller rotates about the axis of rotation. A fixed surface is formed in at least one sidewall of the casing for directing fluid back toward the impeller. Improved operating characteristics and extended range are accomplished through modification to the vane configuration of the impeller and/or by modification of the side channel configuration of the pump chamber in an asymmetrical fashion. The vanes can be modified to include a radially inward based portion extending in a generally trailing direction with respect to rotation of the impeller and a radially outward tip portion extending in a generally leading direction. The blades may also include a chamfered surface on the trailing edge of the base portion. The impeller chamber can be modified separately by expanding a side channel in the casing, or by insertion of a spacer between the side channel and the remaining portion of the casing defining the impeller chamber.